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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, CUONG QUANG

ART UNIT PAPER NUMBER

2811

DATE MAILED: 03/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/971,955

Applicant(s)

BASCERI ET AL.

Examiner

Cuong Q Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16, 17, 29-36 and 54-77 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-17, 29-36 and 54-77 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on 10/04/01 is acceptable.

Information Disclosure Statement

2. The Information Disclosure Statement filed on 10-04-01 has been considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 71 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 71 recites the limitation "the second nucleation layer" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national

application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant, for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 16-17, 29-33, 67-69 and 72-73 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al. (JP406333772A).

Regarding claims 16-17, 29, 30, 72, 73, Fujii et al. discloses a thin film capacitor structure comprising: a substrate assembly (1); an electrode material (2, a Pt layer) formed over the substrate; a nucleation layer (3, a NiO layer); a BST film (4) having a substantially uniform crystal orientation of (100). See Fujii et al.'s Fig.1.

Regarding claims 31, 32, 33, 67, 68, 69, as shown in Fujii et al.'s Fig.4, an orientation layer (43, a Pt layer having an orientation of (100) (a first electrode layer) formed between the BST layer (44) and the NiO nucleation layer (42) and a second electrode layer (45) formed on the BST layer.

Claims 16-17, 29, and 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Abe et al. (US 5,889,299).

Abe et al. discloses a thin film capacitor structure comprising: a nucleation layer (1); an orientation layer (2, a Pt layer having a cubic system of (100) orientation); BST film (3) having a substantially uniform crystal orientation of (100) (a cubic system). See Abe et al.'s Fig.1 and col.19-20.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 34-36, 54- 66, 70-71, and 74-77, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Summerfelt et al. (US 5,781,404).

Fujii et al. teaches all the limitations of claims 29- 33 and 67-69 as shown above but does not teach that a second nucleation layer formed between the BST film and the orientation layer.

Regarding claims 34, 54, 55, 56, 57, 58, 59, 60, 63, 70, 71, 74, Summerfelt et al. discloses a thin film capacitor structure comprising: a strontium titanate (ST) layer (32) formed between a BST layer (34) and a Pt layer (30). See Summerfelt et al.'s Fig.5.

It would have been obvious to one of ordinary skill in the art to incorporate the ST layer between a BST layer and a Pt layer as taught by Summerfelt et al. into Fujii et al.'s device (Fig.4) in order to reduce the leakage current. See Summerfelt et al.'s col.3 lines 15-25.

It is noted that the ST layer is considered as a second nucleation layer which is contains Ti.

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Regarding claims 75 and 76, in Summerfelt et al.'s TABLE 2, the layer (32) can be formed of Nb or Mn instead of ST.

Regarding claim 64, Fujii et al. does not explicitly teach that the substrate assembly includes polysilicon.

It is conventional and also taught by Summerfelt et al. that a polysilicon plug is commonly formed to connect the lower capacitor electrode to the silicon substrate.

It would have been obvious to one of ordinary skill in the art to form the conventional polysilicon plug as taught by Summerfelt et al. into Fujii et al.'s device in order to connect the lower capacitor electrode to the silicon substrate.

Regarding claims 35, 36, 61, 62, 65, 66, and 77, Fujii et al. and Summerfelt et al. substantially teach all the limitations of claims 29, 54, 67 and 72. However, these references do not explicitly teach the nucleation having a thickness of less than about 50 angstroms, BST film having a thickness of about 150 to 300 angstroms, wherein BST film comprising about 50 and 53.5 atomic % of Ti.

It would have been obvious to one of ordinary skill in the art to provide the nucleation layer, BST layer having a thickness in the range as claimed and percent of Ti in BST as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPTO 233.

Conclusion

6. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

7. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (703) 308-1293. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor TOM THOMAS who can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722 or 308-7724.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Receptionists whose telephone number is 308-0956.

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A handwritten signature in black ink, appearing to read 'Cuong' followed by a stylized surname.

Cuong Nguyen

Patent examiner 2811

February 20, 2003